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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/709,722	11/13/2000	Chiyoaki Iijima	107263	4658

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EXAMINER	
NGUYEN, FRANCIS N	

ART UNIT	PAPER NUMBER
2674	13

DATE MAILED: 12/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/709,722	IIJIMA ET AL.	
	Examiner	Art Unit	
	FRANCIS NGUYEN	2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-9 and 11-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8 and 19* is/are allowed.

6)☐ Claim(s) *1,3,6-7,9,11,17-18,20-22* is/are rejected.

7)☐ Claim(s) *4,5 and 12-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. The amendment filed on 10/15/2003 is entered. The final Office Action (paper #11) is now withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 6-7, 9, 11, 17-18, 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutome et al. (US Patent 6,037,920) in view of Ogino et al. (US Patent 4,923,285)

As to **claim 1**, Mizutome et al. discloses a liquid crystal driving method for a liquid crystal panel (see Abstract, column 1, lines 36-41) having a liquid crystal between a pair of electrodes (in which optical characteristics of the liquid crystal are changed by applying a driving signal between the pair of electrodes (column 1, lines 50-54), comprising the steps of

sensing a temperature of at least one of the liquid crystal panel and an environment in which the liquid crystal panel is disposed (**thermistor 102 detecting temperature of LCD 101**, column 2, lines 65-67),

applying a low frequency signal as the driving signal in case that the sensed temperature is low, the low frequency signal being lower than a frequency signal used in the case that the

sensed temperature is normal (column 4, lines 22-52, **frequency 7-26 Hz for temperature range 5-30 deg C** column 6, lines 20-24).

However, Mizutome et al. fails to teach applying a high frequency signal as the driving signal in case that the sensed temperature is high, the high frequency signal having a frequency higher than the frequency of the driving signal used at the normal temperature. Ogino et al. teaches applied voltage at higher frequency at 70 deg C and applied voltage at lower frequency at 57.5 deg C as shown in figure 2A, Table 1 in column 7, lines 21-26); also figure 15D shows clock frequency increases as temperature increases. It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the method of Mizutome et al. then implement the driving frequency increasing as temperature increases as taught by Ogino et al. to obtain the method Mizutome et al. modified by Ogino et al. because it would result in driving the liquid crystal device at a wide range of temperature at different frequencies to maintain contrast .

As to **claim 3**, Mizutome et al. modified by Ogino et al. teaches varying a frequency of the driving signal discontinuously with respect to the sensed temperature (Mizutome et al., pulse width shortened with temperature increase in each temperature region, column 4, lines 44-52).

As to **claim 6**, claim 6 differs from claim 1 in limitation when the temperature is –20 deg C, each pixel is driven at a frequency not greater than 1.28 kHz, and when the temperature is +25 degC, each pixel is driven at a frequency not greater than 2.56 kHz . See the same citations for claim 1 Mizutome et al. modified by Ogino et al. teaches frequency not greater than 1.20kHz (clock frequency at 1kHz, column 10, lines 1-8) and frequency not greater than 2.56 kHz (figure 11, column 10, lines 1-8). Since Mizutome et al. teaches different frequency

ranges at different temperature regions (column 6, lines 18-23, column 7, lines 21-27, column 8, lines 27-34), Ogino et al. teaches in figure 15D , frequency vs temperature relationship, it would have been obvious to a person of ordinary skill in the art the art to drive frequencies 1.28 kHz, 2.56 kHz.

As to **claim 7**, Mizutome et al. modified by Ogino et al. teaches that when the temperature is +70 deg C, each pixel is driven at a frequency not greater than 4.16 kHz (note Ogino et al. does teach driving frequency of 1 kHz, 2kHz (column 10, lines 1-8).

As to **claim 9**, Mizutome et al. discloses a liquid crystal device comprising a liquid crystal panel having a liquid crystal between a pair of substrates (column 1, lines 44-49) and a driving circuit (**drive voltage generation circuit 104, scanning electrode circuit 103a and a data electrode drive circuit 103b** , column 3, lines 23-25) that applies a driving signal between the pair of substrates and that varies optical characteristics of the liquid crystal, the liquid crystal device comprising:

a temperature sensor that senses a temperature of at least one of the liquid crystal panel and an environment in which the liquid crystal panel is disposed (**thermistor 102 attached onto liquid crystal panel 101**, column 2, lines 65-67); and

temperature compensating device (**panel control circuit 105 controls time of application** column 4, lines 61-67) that applies a low frequency signal as the driving signal in case that the sensed temperature is low, the low frequency signal having a frequency of a driving signal used in case that the sensed temperature is normal (low **frequency 7-26 Hz for low temperature range 5-30 deg C** column 6, lines 20-24).

However, Mizutome et al. fails to teach applying a high frequency signal as the driving signal in case that the sensed temperature is high, the high frequency signal having a frequency higher than the frequency of the driving signal used at the normal temperature. Ogino et al. teaches applied voltage at higher frequency at 70 deg C and applied voltage at lower frequency at 57.5 deg C as shown in figure 2A, Table 1 in column 7, lines 21-26); also figure 15D shows clock frequency increases as temperature increases. It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus of Mizutome et al. then implement the driving frequency increasing as temperature increases as taught by Ogino et al. to obtain the apparatus Mizutome et al. modified by Ogino et al. because it would result in driving the liquid crystal device at a wide range of temperatures at different frequencies to maintain contrast, save power consumption.

As to **claim 11**, see the same citations for claim 9. Claim 11 differs from claim 9 in limitation varying a frequency of the driving signal discontinuously with respect to the sensed temperature Mizutome et al. modified by Ogino et al. teaches varying a frequency of the driving signal discontinuously with respect to the sensed temperature (Mizutome et al., pulse width shortened with temperature increase in each temperature region, column 4, lines 44-52).

As to **claim 17**, Mizutome et al. modified by Ogino et al. teaches that when the temperature is +70 deg C, each pixel is driven at a frequency not greater than 4.16 kHz (note Ogino et al. does teach driving frequency of 1 kHz, 2kHz (column 10, lines 1-8).

As to **claim 18**, Mizutome et al. modified by Ogino et al. teaches that when the temperature is +70 deg C, each pixel is driven at a frequency not greater than 4.16 kHz (note Ogino et al. does teach driving frequency of 1 kHz, 2kHz (column 10, lines 1-8).

As to **claim 20**, Mizutome et al. modified by Ogino et al. teaches the temperature compensating device is a synchronizing signal frequency varying device (Ogino et al., voltage controlled oscillator shown in figure 15A) that varies a frequency of the driving signal by varying a frequency of a synchronizing signal (clock shown in figure 15B) applied to a liquid crystal drive control circuit for controlling the device circuit based on the sensed temperature).

As to **claim 21**, Mizutome et al. modified by Ogino et al. teaches the temperature sensor being a thermistor formed together with driving circuit in a semiconductor device (Mizutome et al. , thermistor, column 2, line 66 through column 3, line 40).

As to **claim 22**, Mizutome et al. modified by Ogino et al. teaches an electronic apparatus comprising the liquid crystal device as a display device (Mizutome et al. , liquid crystal apparatus, column 2, lines 57-58).

Allowable Subject Matter

4. Claims 8 and 19 are allowed.

5. Claims 4, 5, 12, 13, 14, 15, 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As to claims 4, 5, 8, 12, 13, 14, 15, 16 and 19, none of prior art teaches a frame frequency.

Response to Arguments

6. Applicant's arguments filed on 10/15/2003 have been considered but are moot in view of the new ground(s) of rejection as described above.

Conclusion

7. The prior art made of record not relied upon is pertinent to Applicant's disclosure

US Patent	Memarzadeh et al.	5,414,441
US Patent	Tsuboyama et al.	4,902,107
US Patent	Ooki et al.	5,033,822

Reference Memarzadeh et al. is made of record as it discloses a temperature compensation apparatus for liquid crystal display.

Reference Tsuboyama et al. is made of record as it discloses a liquid crystal device comprising a temperature sensor and a variable frequency generator.

Reference Ooki et al. is made of record as it discloses a liquid crystal apparatus comprising a temperature sensor and a frequency controller.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **FRANCIS N NGUYEN** whose telephone number is **703 308-8858**. The examiner can normally be reached during hours 8:00 AM- 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **RICHARD A HJERPE** can be reached at 703 305-4709.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service whose telephone number is (703) 306-0377.

FRANCIS N NGUYEN
Examiner
Art Unit 2674

FN
November 18th, 2003

RICHARD HJERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600